University of California
Lawrence Livermore National Laboratory

Chemistry and Materials Science Directorate

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Our cutting-edge knowledge of chemistry and materials science supports Livermore's many projects

Mission

The Chemistry and Materials Science (C&MS) Directorate provides cutting-edge expertise in chemistry and materials science to ensure the success of Livermore's national-security mission and its related core programs. We anticipate and initiate R&D projects relevant to current and long-term U.S. technology and security needs, including science-based stockpile stewardship, the National Ignition Facility, and new energy, environmental, and health-care technologies.

Science and Technology

Livermore's multidisciplinary project teams, staffed with innovative and creative scientists drawn from many scientific disciplines, include chemists and materials scientists with expertise in the following areas:

- Analytical chemistry.
- Isotope sciences.
- Nuclear instrumentation.
- Isotope hydrology.
- Energetic materials.
- Physical, inorganic, and polymer chemistry.
- Solid-state chemistry.
- Chemical engineering.
- Metallurgy and ceramics.
- Materials characterization.
- Surface sciences.
- Thin films, multilayers, and nanostructures.
- Materials theory, simulation, and modeling.

Recent Accomplishments

- Design, development, and demonstration of critical materials, processes, and surveillance tools for ensuring the safety, security, and reliability of the U.S. nuclear stockpile.
- Development of novel materials engineered on the nanometer scale with many potential industrial applications, including aircraft engines with improved performance.
- Demonstration of the applicability of aerogels for vastly improved energy storage and environmental restoration.
- Development of x-ray microtomography as a diagnostic tool for medical research.

Benefits to the Nation

The C&MS Directorate provides a critical scientific and technological knowledge base necessary for the success of Livermore's multidisciplinary approach to solving real-world problems. Our progress in the nanoengineering of novel materials, such as aerogels and multilayers, has significant implications for the future of structural materials, components for energy-storage and energy-generation devices, and electronic, magnetic, and optical materials. Of equal importance is the specialized expertise of our scientists in energetic and nuclear materials, a knowledge base that is critical to national security. We also make important contributions to the quality

of the environment, both through the innovative application of materials to environmental remediation efforts and through the use of analytical and radiochemical skills to ensure that Livermore activities do not adversely affect the environment.

Technical Excellence

The scientific quality of the C&MS Directorate's core strengths is recognized nationally and internationally. We have competed for and been awarded many projects in fundamental and applied science by the Departments of Energy and Defense and other government agencies. We support important Livermore programs in national security, environmental, energy, transportation, and information technologies. C&MS scientists serve on a wide range of national and international committees that are shaping the future for chemistry and materials science worldwide. Participation by the C&MS Directorate in scientific partnerships has been extensively sought by industry and the commercial sector, and these partnerships have benefited from and strengthened our core science and technology.

Contact

Jeffrey Wadsworth, Associate Director, Chemistry and Materials Science;
Phone: (510) 423-2184; Fax: (510) 424-2252; E-mail: wadsworth3@llnl.gov

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